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TIME DISTORTION — A COMPARISON OF HYPNOTIC INDUCTION AND PROGRESSIVE RELAXATION PROCEDURES: *A Brief Communication*

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Abstract: Hypnotic experiences are frequently associated with alteration in temporal perception. 24 male and 24 female Ss were asked to estimate the interval associated with hypnotic, relaxation, or control procedures. Only the group that received the hypnotic condition displayed significant distortions in time estimations. These were primarily underestimations (temporal constriction or "time loss") compared to the more normal distributions of estimations for the other 2 groups of Ss. The hypnotic treatment explained about 35% of the variance in the absolute distortion of time estimates. The present study demonstrates that subjective distortions of time experience during a hypnotic procedure are more than an artifact of deep relaxation or instruction.

Both clinical observations and research (Bowers & Brenneman, 1979; St. Jean, MacLeod, Coe, & Howard, 1982; Schwartz, 1978) have demonstrated that individuals who undergo hypnosis also display time distortion. The most common experience is "temporal constriction," whereby the experienced interval is much shorter than the actual or real time. Because many hypnotized Ss experience some amnesia, this distortion may be described as "missing time" in more exotic settings. No one has determined, however, whether the temporal distortions are specifically related to the hypnotic condition or are simply an artifact of the concomitant relaxation.

The differentiation between general relaxation and hypnotic-specific factors in time distortion experiences is essential because several authors have argued that the hypnotic condition can be totally simulated by instructional or demand characteristics of the situation (Barber 1964, 1972) or through progressive relaxation (Carter[4]; Edmonston, 1981). Zimbardo, Marshall, White, and Maslach (1973), however, demonstrated that neither relaxation nor pretention of hypnosis evoked time distortion that was similar to Ss exposed to traditional hypnotic treatments. The primary purpose of the present study was to determine if time distortion during a hypnotic procedure was an artifact of relaxation.

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METHOD

Subjects

Forty-eight patients (24 males, 24 females) ranging from 21 to 53 years of age served as Ss. All Ss were volunteers who had been referred to the out-patient clinic of a psychiatric hospital. The primary referral symptomatology involved either anxiety or panic attacks. Patients were randomly assigned to either the progressive relaxation, hypnosis, or control groups by an in-take worker following an initial assessment concerning the benefit of some form of relaxation training.

Procedure

Each client in the relaxation and hypnosis groups was informed that the purpose of the procedure was to facilitate relaxation. A standard progressive relaxation procedure based upon the work of Wolpe (1958) and Lazarus (1971) was administered by the clinician to the relaxation group. The first stage involved the occurrence of muscle relaxation through alternating tension and relaxation of specific muscle groups. Care was taken not to keep the duration of tensing constant. Emphasis was placed upon learning to relax in order to utilize the technique outside of the hospital setting. The hypnosis group was administered an eye closure induction. Emphasis was placed on obtaining relaxation through self-hypnosis so that the procedure could be initiated outside of the hospital.

Both procedures required about 30 (plus or minus 7) minutes to complete. The control group underwent a standard psychiatric interview as a part of their initial assessment. All Ss were seen individually in an office at various times between 0900 and 1700 hrs. Care was taken to eliminate the presence of time pieces. At the end of the procedure Ss were asked, "How much time do you think that took?" After obtaining the answer, the actual time duration was given and S was debriefed with respect to the purpose of the experiment.

There were two measures of time distortion. The first was simply the *absolute value* of the difference between the subjective time estimate and the actual duration. This measure was used to determine the magnitude of the distortion without contamination by direction (dilation or constriction). The second measure was the *mean* difference between the subjective time estimate and the objective time. This measure was calculated by subtracting the reference time from the subjective estimate and was used to determine the net direction.

RESULTS

The primary analysis involved comparison of the three groups (relaxation, hypnosis, control). One-way ANOVAs with a posteriori comparisons (Duncan's set at $p < .05$) were completed for both measures of time estimation. Because of the anticipated differences in group variances, nonparametric (Kruskal-Wallis) analyses were also included to accommodate possible violations of homogeneity of variance. Because gender differences were considered a possible factor, two-way ANOVAs were performed as well. All analyses were completed using SPSSX software on a VAX computer.

The one-way ANOVAs demonstrated statistically significant differences between the groups for the absolute value of differences in time estimation ($F = 8.94$, $df = 2,45$; $p < .001$). The means and standard deviations (in minutes) are shown in Table 1. A posteriori comparisons indicated that the hypnosis group displayed more time distortion compared to the relaxation and control groups who did not differ from each other. The tests for homogeneity of variance, however, were significant (Bartlett-Box $F = 7.94$; Cochrane's $C = .77$; $p < .001$). A Kruskal-Wallis one-way ANOVA was also significant (χ^2 22.45, $p < .001$). Consequently,

TABLE 1

MEANS AND STANDARD DEVIATIONS (IN MINUTES) FOR THE ABSOLUTE VALUE OF THE DIFFERENCE AND THE MEAN DIFFERENCE IN SUBJECTIVE TIME ESTIMATIONS RELATIVE TO THE ACTUAL DURATION FOR THE GROUPS THAT RECEIVED THE CONTROL, RELAXATION, AND HYPNOSIS TREATMENTS

Group	*N*	Absolute Value	Mean Estimate
Control	16	12.2 ± 16.7^a	-2.8 ± 20.1^a
Relaxation	16	7.8 ± 5.8^a	-7.8 ± 5.8^a
Hypnosis	16	23.8 ± 7.1^b	-18.4 ± 17.1^b

Note. — a versus b = $p < .05$.

the heterogeneity of variance was not totally responsible for the magnitude of the parametric difference between groups means.

The means and standard deviations for the mean differences in subjective time estimation (in minutes) are also shown in Table 1. A one-way ANOVA indicated a significant difference between the groups ($F = 4.01$, $df = 2,45$; $p = .0$). A posteriori tests indicated that Ss who received the hypnotic treatment reported more constriction (shortening) of time estimation. Heterogeneity of variance between groups was statistically significant (Bartlett-Box $F = 9.81$, $p < .001$). Kruskal-Wallis analyses, however, still demonstrated statistically significant group differences ($\chi^2 = 15.74$, $p < .001$).

Two-way ANOVAs for both measures as a function of group and gender demonstrated no statistically significant sex effect or sex-by-group interaction. The multiple r^2 calculation indicated that 32% of the variance in the absolute value of the time estimates and 15% of the variance in mean time estimates could be explained by the hypnotic treatment.

DISCUSSION

The results of the present study clearly indicate that hypnotic time distortion is significantly greater than that evoked by either progressive relaxation or evoked during the "awake and alert" state. This study differed from that of Zimbardo et al. (1973) because: (*a*) suggestions for time distortion were not given and (*b*) a duration similar to the hypnotic treatment was used to lead Ss through the relaxation procedure. Vectorial characteristics of the subjective time estimation indicated an overall constriction during the hypnotic condition. On the other hand, the means and standard deviations of the time estimations for the control and relaxation groups were around 0. These results indicate that for the two nonhypnotic groups, the average subjective times estimates were similar to the objective times. Thus in the present investigation, the time distortion effect is specific to hypnosis.

One relatively new and unexplained phenomenon was observed in the present study. Bowers (1979) noted that a small percentage of Ss (about 13%) overestimated hypnotic time. In the present study, 12.5% of Ss overestimated the elapsed time. Two of these three Ss were from the hypnotic group while the other was from the control group. Although anecdotal, it is interesting that the three overestimators were undergoing a grief reaction at the time of the experiment. A fourth S (assessed since the completion of this study) who showed overestimation was also grieving.

One limitation of the present study is that hypnotizability scores were not obtained for any of the clients. The likelihood that the volunteers who were given the hypnosis procedure were more suggestible is minimal because the assignment to treatment groups was random. Objective measures of hypnotizability would

have been useful as covariates in the present study in order to discern the interaction between this potential and the hypnotic procedure. Persinger and his colleagues (Persinger & DeSano, 1986; Ross & Persinger, 1987) have reported moderate strength positive correlations between suggestibility and psychometric indicators of enhanced temporal lobe activity; some of these items include alterations in time perception.

Although time distortion has been reported frequently, the degree to which it is affected by personality or clinical presentation must still be quantified. The population in the present study was referred to the clinic because of intense anxiety or panic attacks. Whether or not these results would generalize to other nonanxious, phobic groups might be pursued. It is relevant that psychometrically assessed anxiety loads on the same factorial dimension as that associated with measures of suggestibility and temporal lobe indicators (Persinger & Makarec, 1987). Consequently, the magnitude of the effect that was observed in the present study could be modulated by a personality factor from which the propensity for suggestibility, time distortion during hypnotic procedures, and panic or anxiety are derived.

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